

**The Global Challenge in Ear and Hearing Health: Overview of
the course on Public Health Planning for Hearing Impairment**
Pre-Conference Workshop: Cape Town, 26 October 2018

ROLE OF PUBLIC HEALTH TO MANAGE EAR AND HEARING HEALTH IN LMI COUNTRIES

Andrew Smith



LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE



**Coalition for Global
Hearing Health**

**International
Centre for Evidence
in Disability**



Khayelitsha

(near Cape Town, South Africa)

Question: How do we deal with hearing loss in situations like this?



Rural Malawi

Or this?

**Answer: Re-orientate thinking
to the public health approach**

(especially clinicians in ENT &
audiology)

OUTLINE OF PRESENTATION

- **What is Public Health?**
- **What is the size of the problem?**
- **Prevention of hearing loss**
- **Public health interventions for hearing loss**

CLINICAL MEDICINE: Health of individuals

**CLINICAL
MEDICINE**



CLINICAL MEDICINE: Health of individuals

**Consultation
& Diagnosis,
Treatment,
Follow-up**

**CLINICAL
MEDICINE**



CLINICAL MEDICINE: Health of individuals

**Consultation
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Treatment,
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**CLINICAL
MEDICINE**

**PUBLIC
HEALTH**



CLINICAL MEDICINE: Health of individuals

Consultation
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CLINICAL
MEDICINE

PUBLIC
HEALTH



PUBLIC HEALTH: Health of populations

CLINICAL MEDICINE: Health of individuals

Consultation
& Diagnosis,
Treatment,
Follow-up

**CLINICAL
MEDICINE**



Survey,
Prevention,
Population
interventions,
Re-survey

**PUBLIC
HEALTH**



PUBLIC HEALTH: Health of populations

“Public Health is the art and science of preventing disease, promoting population health and extending life through organised local and global efforts”*

* From Global Public Health: a new era. Beaglehole R, Bonita R. Oxford, 2009

Core Functions of Public Health

Assessment & Monitoring

- Health of communities & populations at risk to identify health problems and priorities

Formulating Public Policies

- To solve identified local and national health problems and priorities

Assuring Health

- All populations have access to appropriate and cost-effective care, including health promotion and disease prevention services

Health systems

SYSTEM BUILDING BLOCKS



ACCESS
COVERAGE

QUALITY
SAFETY

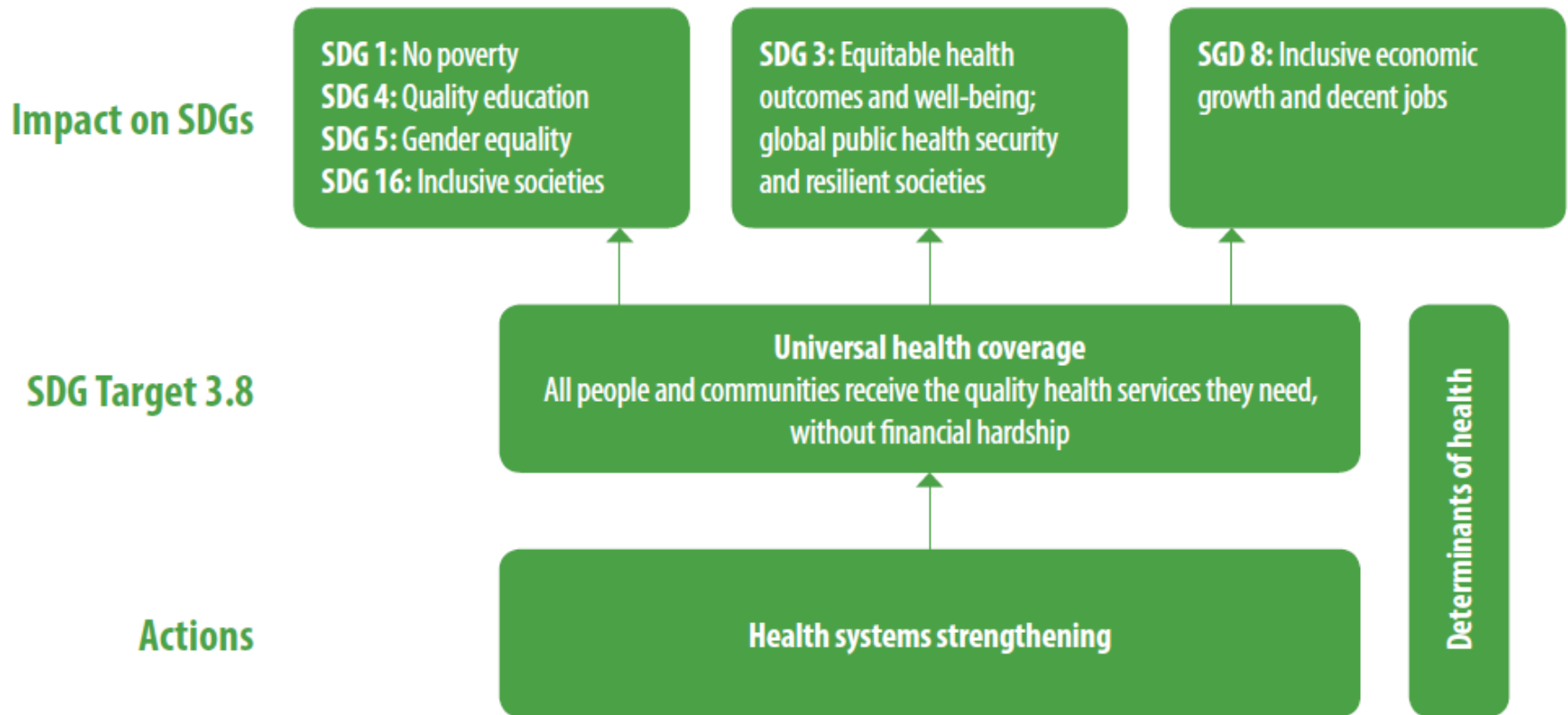


OVERALL GOALS / OUTCOMES



UNIVERSAL HEALTH COVERAGE

Fig. 2. Investing in health systems to reach UHC and the SDGs



Source: adapted from Kieny et al., 2017 WHO Bulletin (13).

‘Universal coverage is the single most powerful concept that public health has to offer’ WHO Director-General Margaret Chan

OUTLINE OF PRESENTATION

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Prevalence and incidence

PREVALENCE:

Total number of people who actually have a disease or health condition at any particular time

Prevalence and incidence

PREVALENCE RATE:

Total number of people who actually have a disease or health condition in a population at a particular time

Total number of persons in the same population at the same point in time

WHO Grades of Hearing Impairment

Grade 0 None		25 dB or less	No/slight problems Hears whispers
Grade 1 Slight		26 - 40 dB	Hears/repeats words in normal voice at 1m
Grade 2 Moderate	Child Adult	31 - 60 dB 41 - 60 dB	Hears/repeats words in raised voice at 1m
Grade 3 Severe		61 - 80 dB	Hears words shout- ed into better ear
Grade 4 Profound		81 dB or more	Cannot hear/under- stand shouted voice

**Disabling
hearing
impairment**

[Average 0.5, 1, 2, 4 kHz in better ear]

Is anyone not familiar with this type of scale?

WHO GLOBAL ESTIMATES 2012

In the world:

360 million persons (5.3%) have disabling (moderate or worse) hearing impairment -

328 million of these are adults

32 million of these are children.

1,019 million (15%) have any level of hearing loss (mild or worse)

This was WHO's estimate until 3rd March 2018

WHO GLOBAL ESTIMATES 2012

In the world:

~~360~~ **466 million persons** (~~5.3~~ **6.1%**) have disabling (moderate or worse) hearing impairment -

~~328~~ **432 million** of these are adults

~~32~~ **34 million** of these are children.

~~1,019~~ **1,300 million** (~~15%~~ **17%**) have any level of hearing loss (mild or worse)

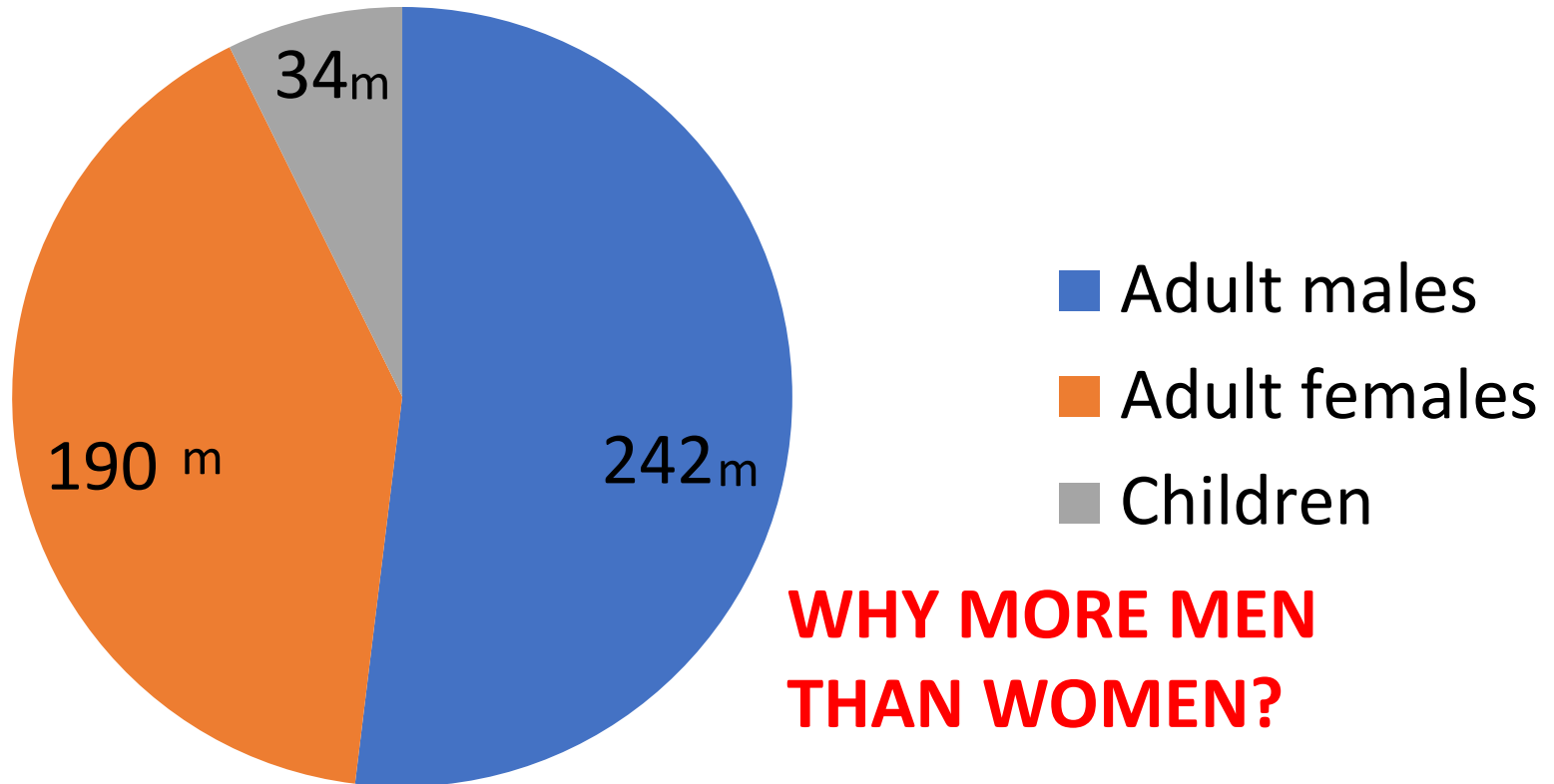
Red figures: official for 2018; Orange: not yet official

>80% live in low & middle income countries

Global numbers with hearing loss in 2018

(Figures from WHO)

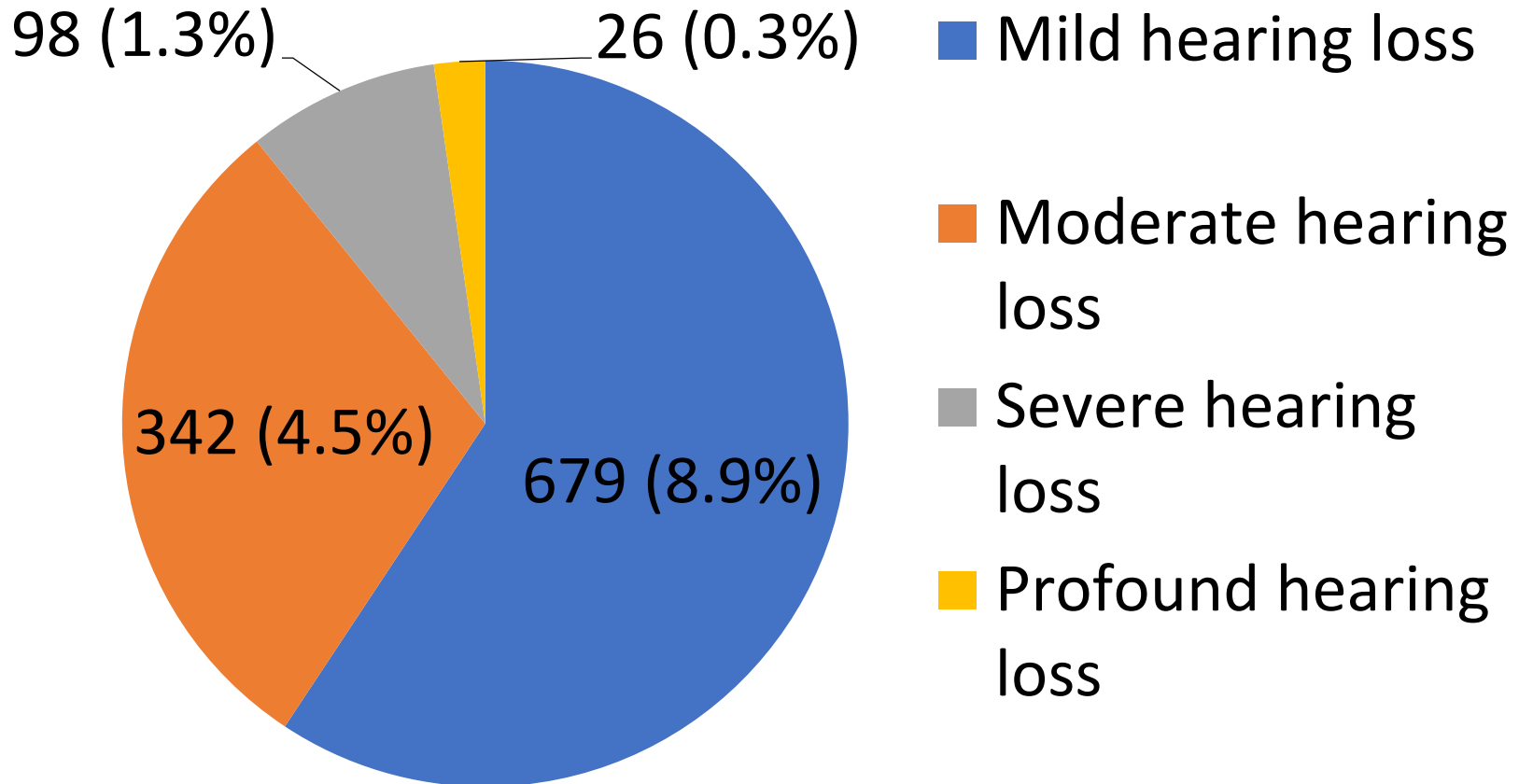
**(1) Numbers with moderate or worse loss = 466 million
(6.1% or 1 in 16 of world population)**



(2) >80% live in low & middle income countries

Global levels of severity in 2018

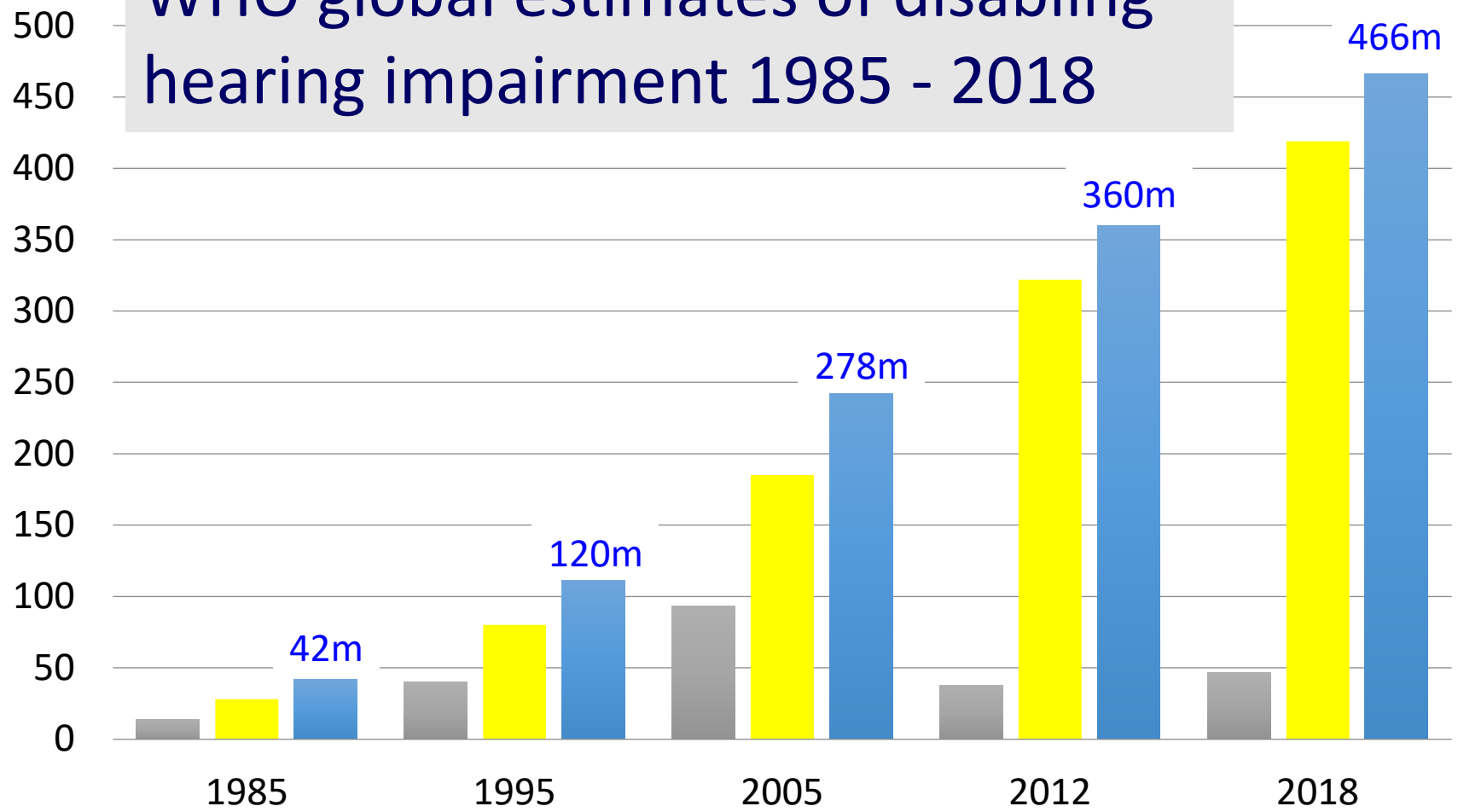
(numbers of person in millions, % = prevalence)



(2) Total numbers with any level of hearing loss = 1,145 million (15% or 1 in 7 of world population)

WHO global estimates of disabling hearing impairment 1985 - 2018

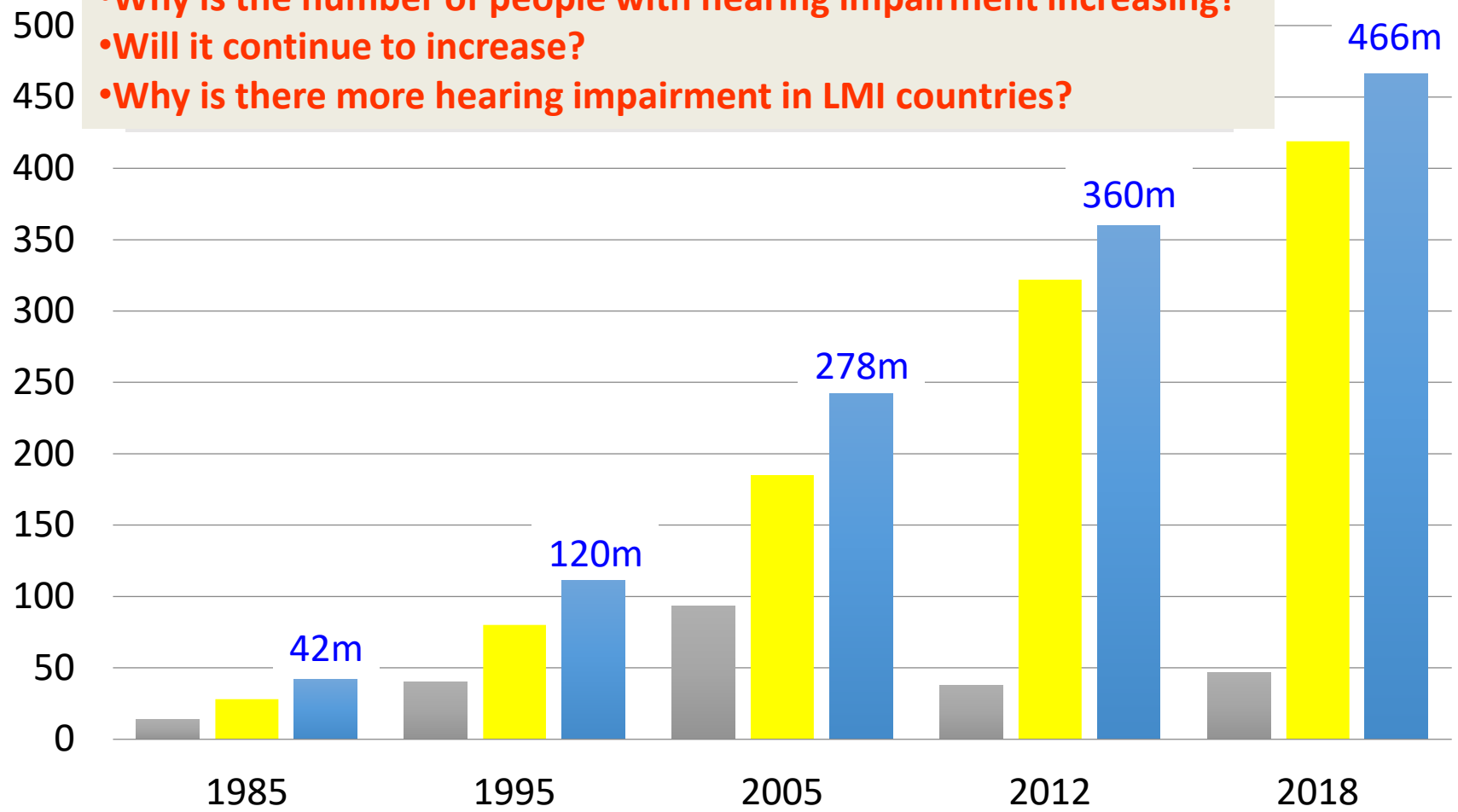
Number with disabling hearing impairment



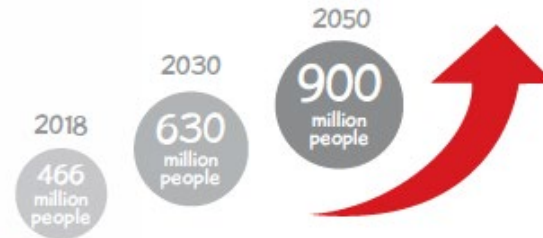
- More developed/High income countries
- Less developed/LMI countries
- TOTAL

Number with disabling hearing impairment

- Why is the number of people with hearing impairment increasing?
- Will it continue to increase?
- Why is there more hearing impairment in LMI countries?



- More developed/High income countries
- Less developed/LMI countries
- TOTAL



Hear
the
future

... and take action now.

Allocate resources for hearing care

Train hearing care professionals

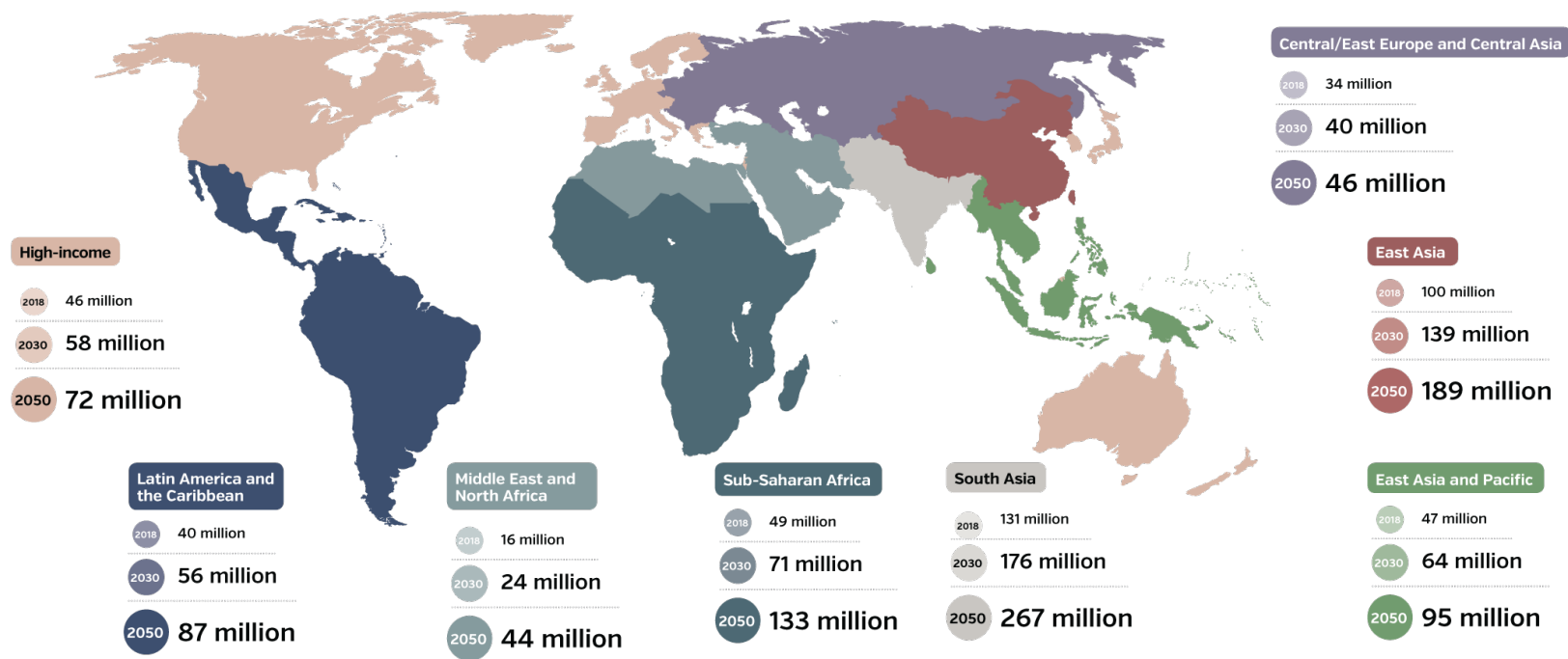
Ensure access to hearing technologies
and communication services

Regulate sound exposure



Released on
World Hearing Day
3/3/2018

Projected number of people with hearing loss in different world regions until 2050

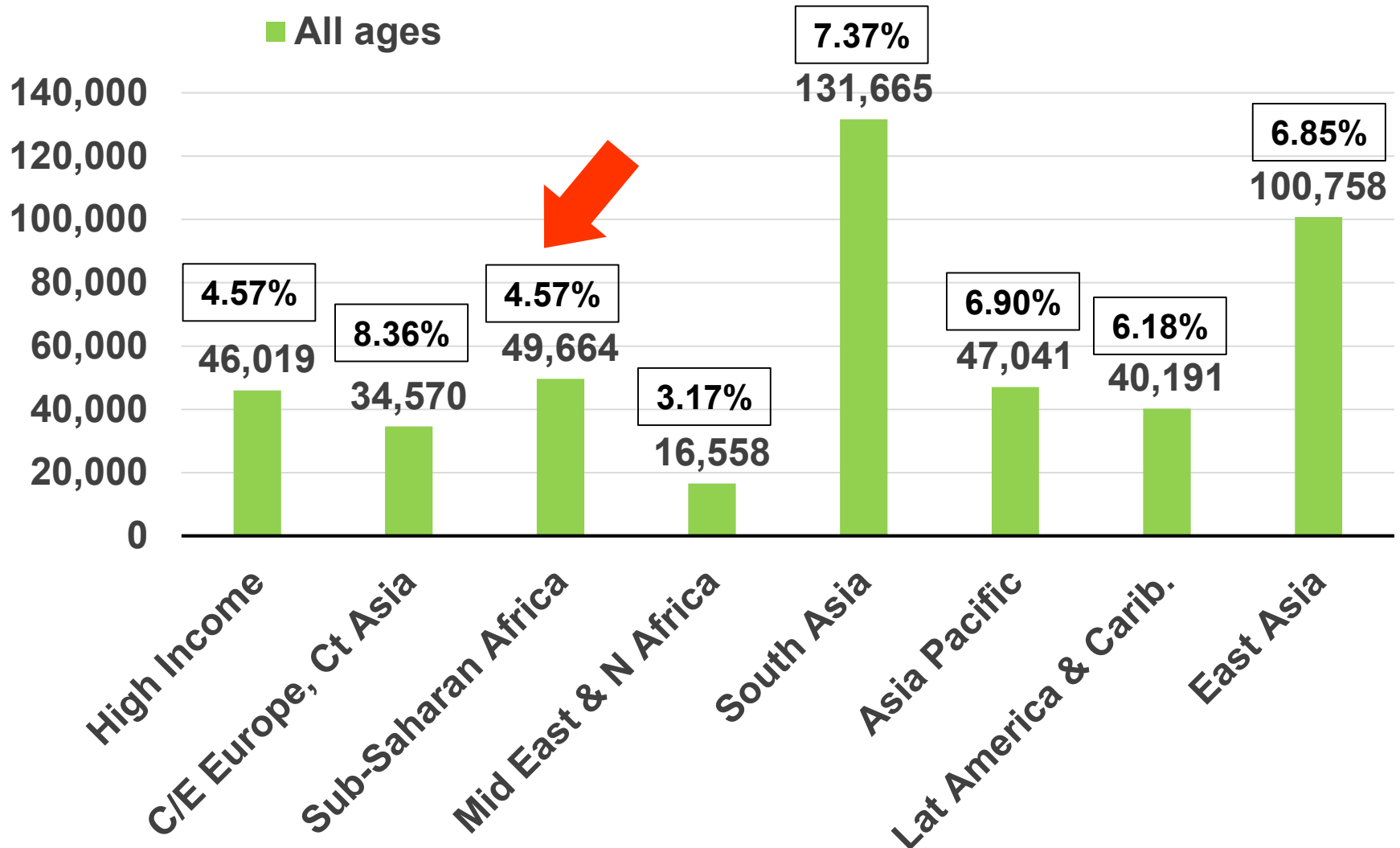


Based on Global Burden of Disease regions
 *The current projections are based on the assumption that age-, gender- and region-specific prevalence of disabling hearing loss does not vary over time.

The map shows the current and projected number of people with hearing loss in different regions. Projections show that the number of people with disabling hearing loss will increase in all regions.

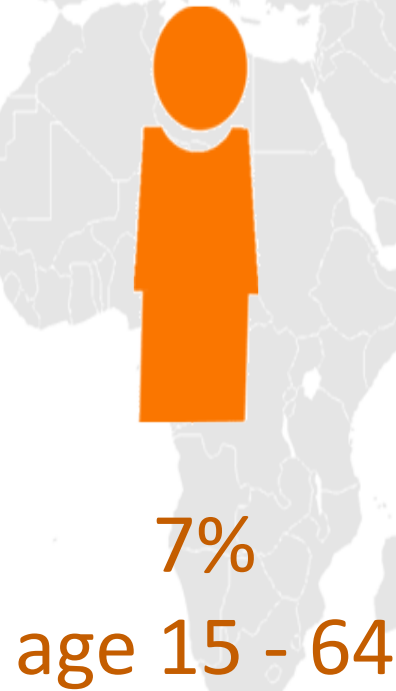
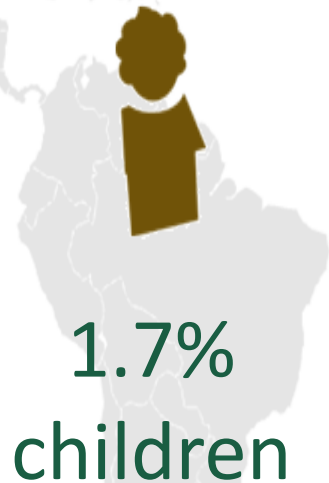
ESTIMATED MILLIONS & PREVALENCE RATES FOR PEOPLE WITH DISABLING HEARING LOSS BY REGION IN 2018.

Numbers of people in thousands

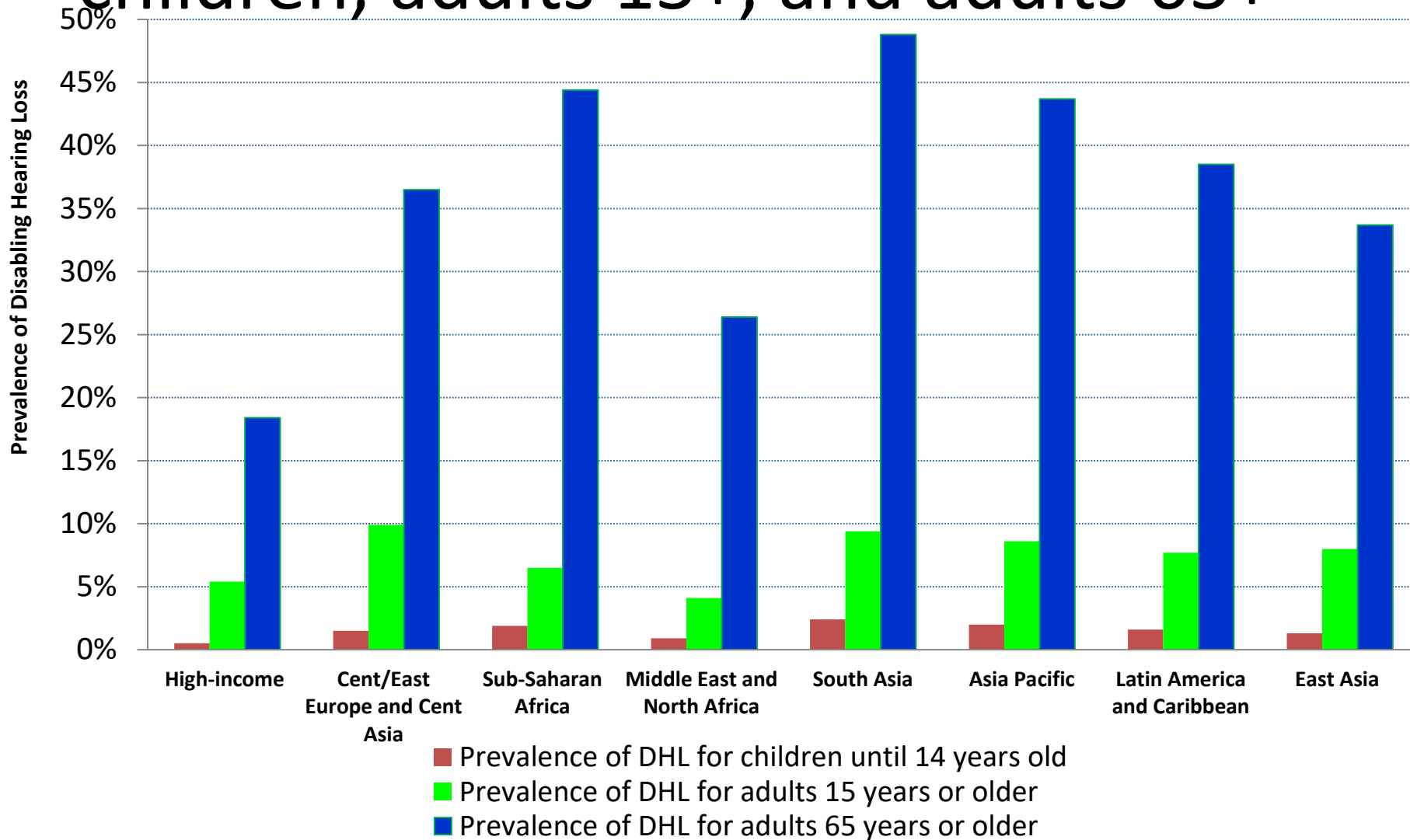


Adapted from: Addressing the rising prevalence of hearing loss, WHO, 2018

Prevalence rate of HI increases with age



Prevalence of disabling hearing loss in children, adults 15+, and adults 65+

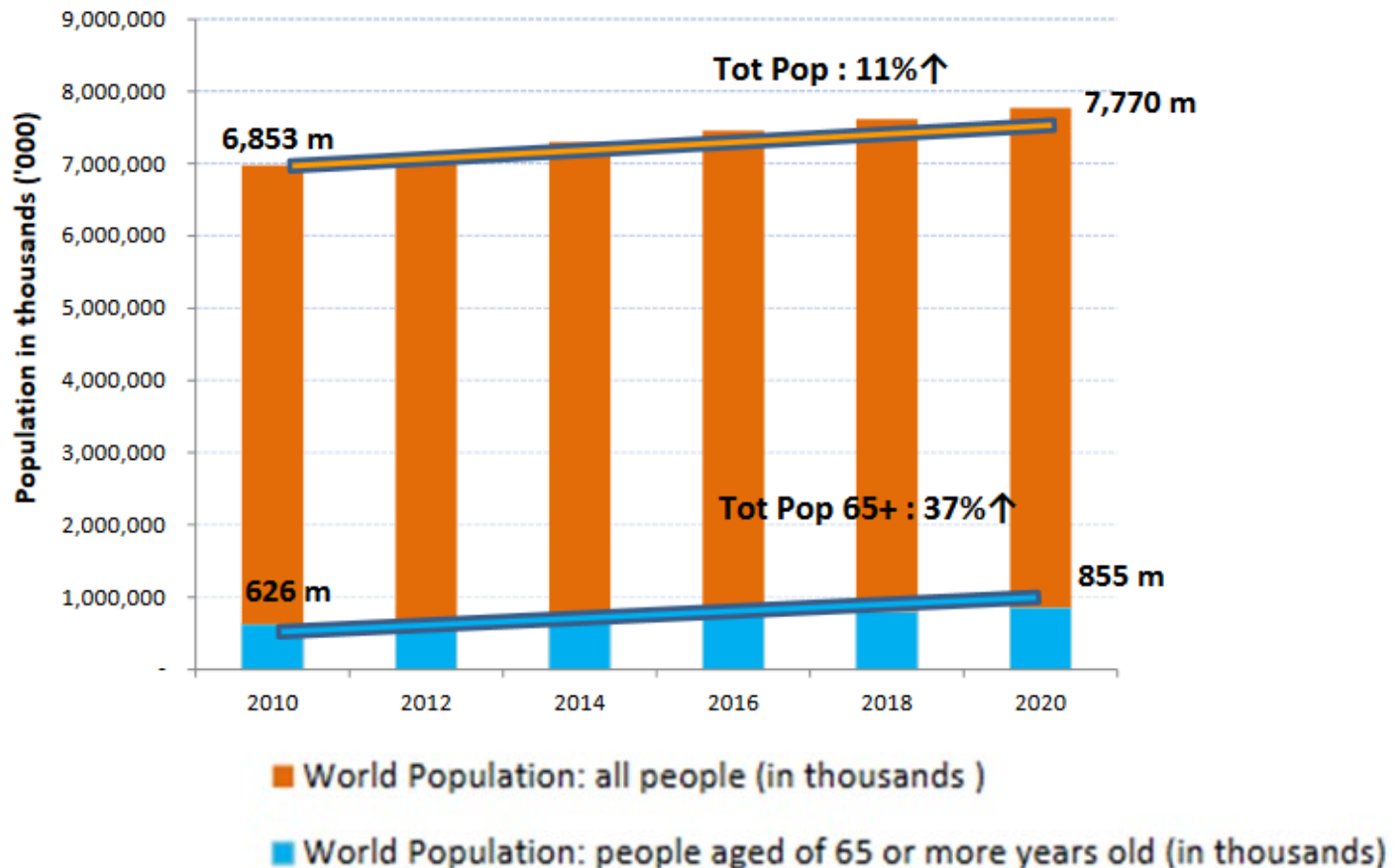


From: Addressing the rising prevalence of hearing loss, WHO, 2018

World Population growth for all ages and people aged of 65 or more years old

2010 – 2020 world population increases

- All ages: 6.9 to 7.8 billion (11% increase)
- Over 65 years: 626 to 855 million (37% increase)



THE LANCET

Volume 380 - Number 9859 - Pages 2053-2260 - December 15, 2012-January 4, 2013

www.thelancet.com

The Global Burden of Disease Study 2010



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Founded 1823 · Published weekly

What is the burden of hearing loss?

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Global hearing health care: new findings and perspectives

Blake S Wilson, Debara L Tucci, Michael H Merson, Gerard M O'Donoghue



In 2015, approximately half a billion people had disabling hearing loss, about 6–8% of the world's population. These numbers are substantially higher than estimates published before 2013, and point to the growing importance of hearing loss and global hearing health care. In this Review, we describe the burden of hearing loss and offer our and others' recommendations for halting and then reversing the continuing increases in this burden. Low-cost possibilities exist for prevention of hearing loss, as do unprecedented opportunities to reduce the generally high treatment costs. These possibilities and opportunities could and should be exploited. Additionally, a comprehensive worldwide initiative like VISION 2020 but for hearing could provide a focus for support and also enable and facilitate the increased efforts that are needed to reduce the burden. Success would produce major personal and societal gains, including gains that would help to fulfil the "healthy lives" and "disability inclusive" goals in the UN's new 2030 Agenda for Sustainable Development.

Introduction

Results from the most recent Global Burden of Disease (GBD) Studies^{1–3} indicate a growing, and now alarmingly high, burden of hearing loss. Analyses of the results to

processing,^{4,5} especially before about age 3 years⁶ and perhaps again after about age 60 years.^{12,14} Hearing loss in those early years precludes or delays the acquisition of spoken language.^{15,16} Children with severe or worse

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[S0140-6736\(17\)31073-5](http://dx.doi.org/10.1016/S0140-6736(17)31073-5)

Division of Head and Neck Surgery and Communication Sciences, Department of Surgery, Duke University Medical Center, Durham, NC, USA (Prof B S Wilson DSc, Prof D L Tucci MD); Duke Global Health Institute

(Prof B S Wilson, Prof D L Tucci)

Prof M H Merson MD,

Department of Biomedical Engineering (Prof B S Wilson),

and Department of Electrical and Computer Engineering

(Prof B S Wilson), Duke

[http://dx.doi.org/10.1016/S0140-6736\(17\)31073-5](http://dx.doi.org/10.1016/S0140-6736(17)31073-5)

high, burden of hearing loss. Analyses of the results to enable direct comparisons across the studies show that hearing loss was the 11th leading cause of years lived with disability (YLDs) in 2010 and the fourth leading cause in both 2013 and 2015 (appendix pp 2–3). Moreover, the prevalence of disabling hearing loss is far greater today

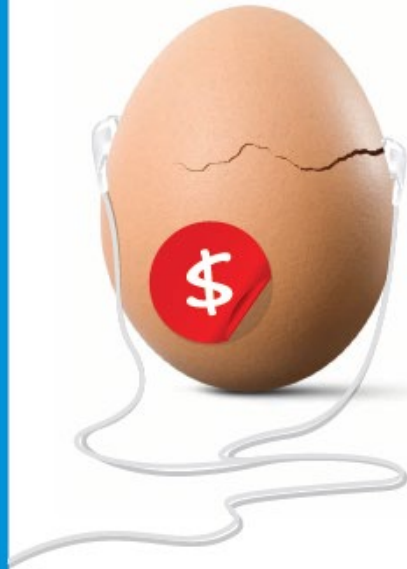
Rank	2010	2013	2015
1	Low back pain	Low back pain	Low back and neck pain
2	Major depression	Major depression	Depressive disorders
3	Iron-deficiency anaemia	Iron-deficiency anaemia	Iron-deficiency anaemia
4	Neck pain	All hearing loss	All hearing loss
5	COPD	Neck pain	Skin diseases
6	Other musculoskeletal disorders	Diabetes	Diabetes
7	Anxiety disorders	Migraine	Migraine
8	Migraine	COPD	Other musculoskeletal disorders
9	All vision loss	Anxiety disorders	Anxiety disorders
10	Diabetes	Other musculoskeletal disorders	All vision loss
11	All hearing loss	All vision loss	Oral disorders
12	Falls	Schizophrenia	Asthma

RANKINGS OF YEARS LIVED WITH DISABILITY (YLDs) IN THE GLOBAL BURDEN OF DISEASE (GBD) STUDIES




From: Wilson et al, Lancet 2017

A different burden....

*Unaddressed
Hearing Loss Has
a High Cost!*



**\$750
billion**

-  Barrier to education and social integration
-  Loss of productivity
-  Cognitive decline and depression

3 March 2017
World Hearing Day

ACTION FOR HEARING LOSS

Make a Sound Investment 

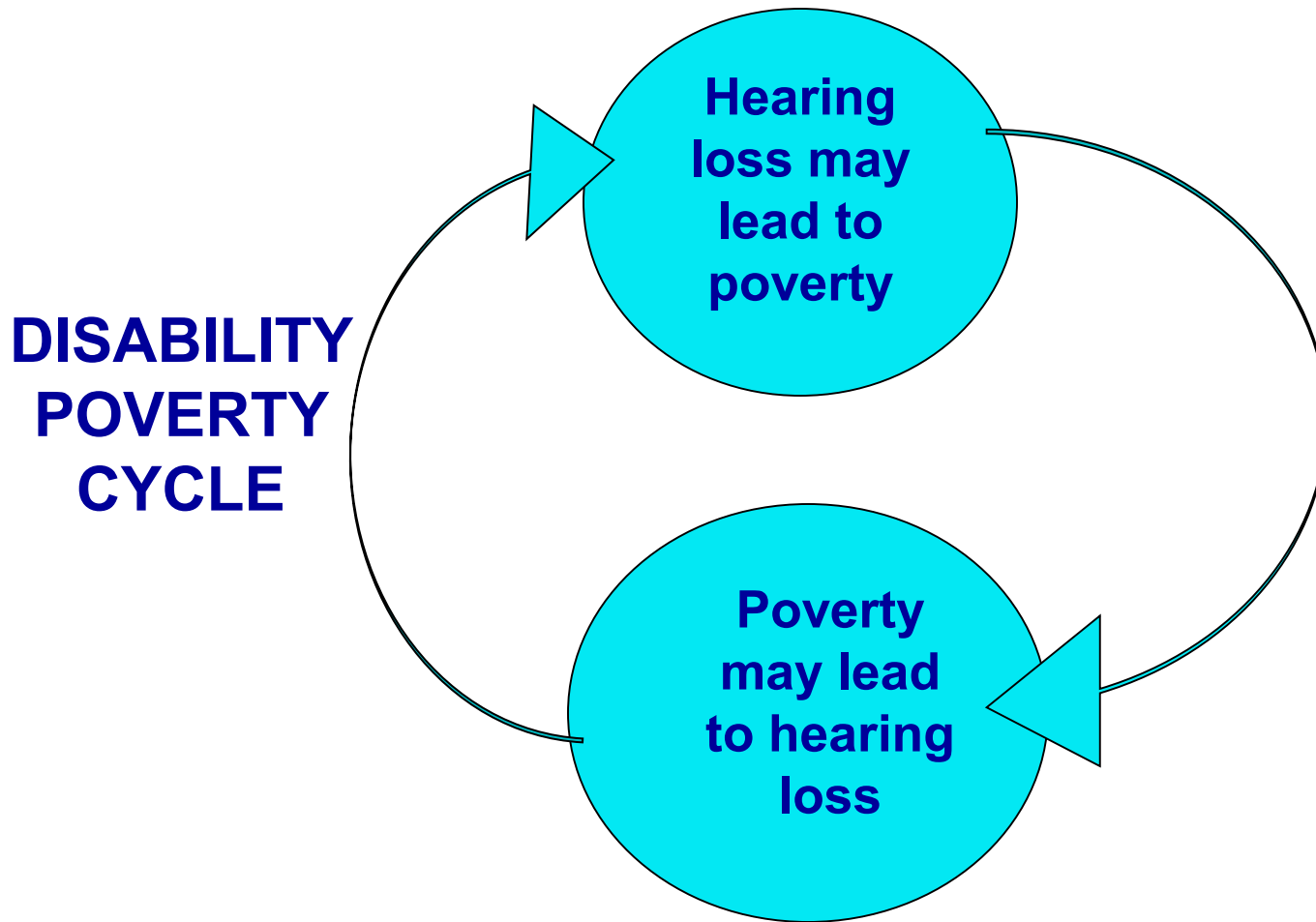


www.who.int/pbd/deafness/en

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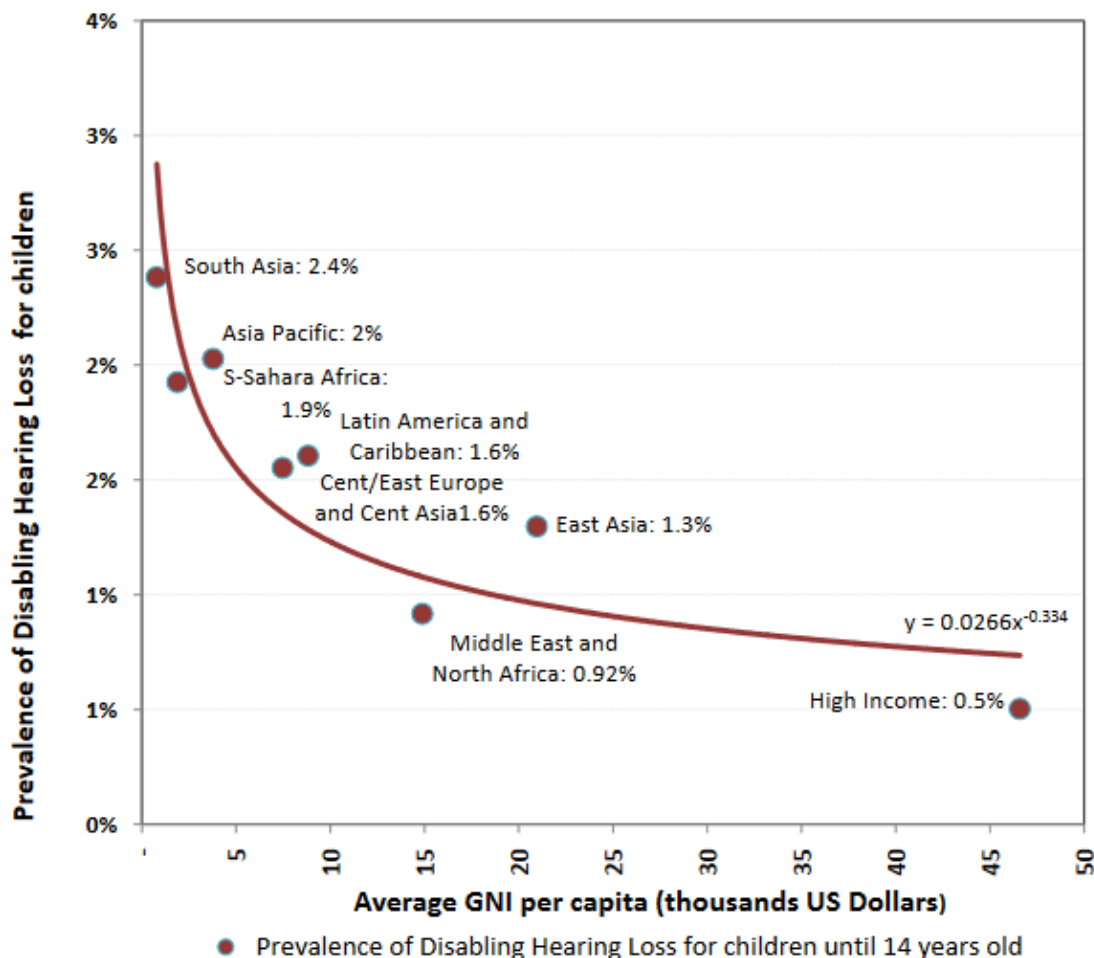


Hearing Disability & Poverty Trap



Prevalence of Disabling Hearing Loss for children versus average GNI per capita:*

In children, prevalence decreases exponentially as GNI increases.



*GNI per capita: gross national income per capita

*MBD, WHO, 2012 DHL estimates,

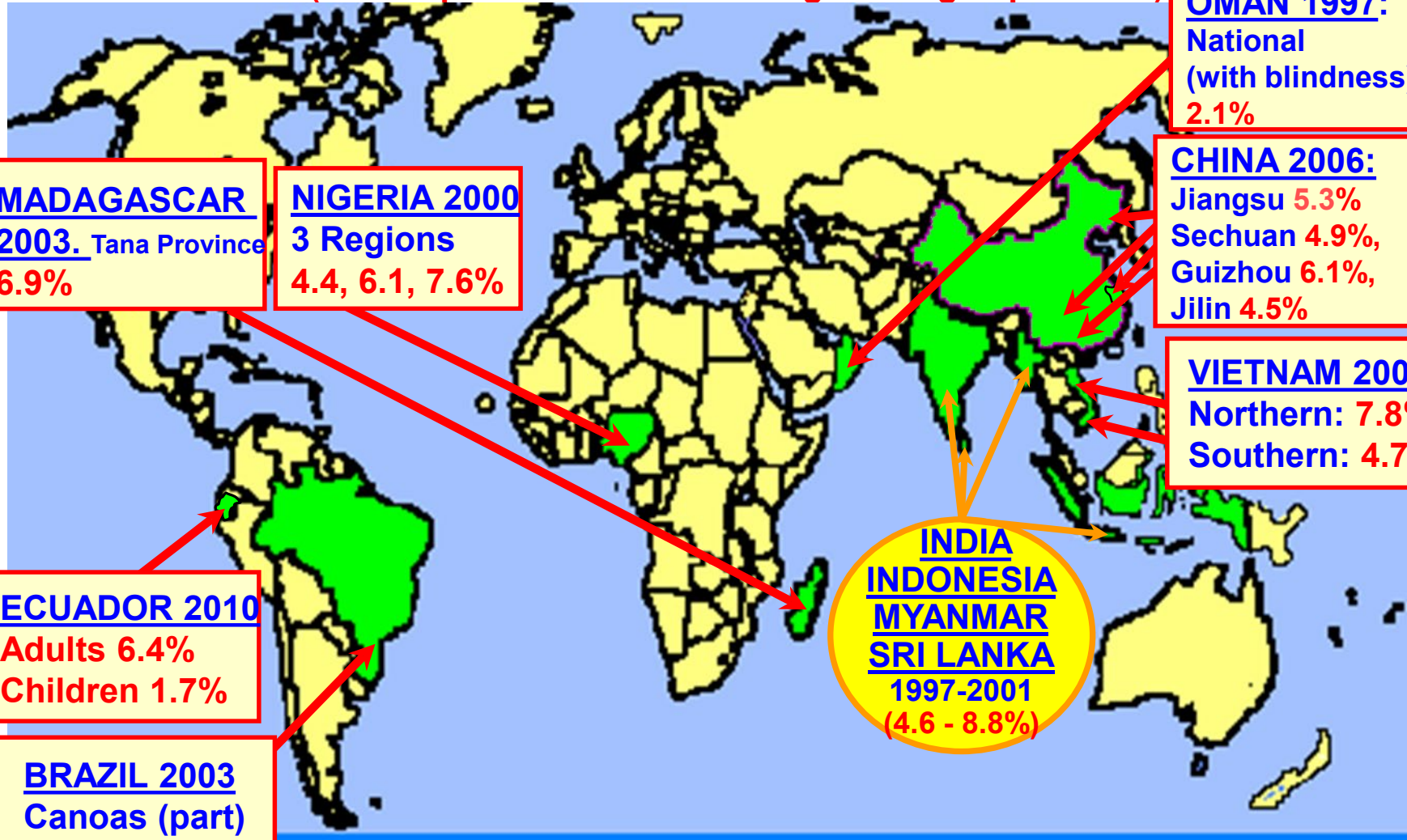
But...

we lack

good and sufficient prevalence data.....

Population-based Surveys using The WHO Ear And Hearing Disorders Survey Software

(with % prevalence of disabling hearing impairment)



OMAN 1997:
National
(with blindness)
2.1%

CHINA 2006:
Jiangsu 5.3%
Sechuan 4.9%,
Guizhou 6.1%,
Jilin 4.5%

VIETNAM 2001:
Northern: 7.8%
Southern: 4.7%

INDIA
INDONESIA
MYANMAR
SRI LANKA
1997-2001
(4.6 - 8.8%)

MADAGASCAR
2003. Tana Province
6.9%

NIGERIA 2000
3 Regions
4.4, 6.1, 7.6%

ECUADOR 2010
Adults 6.4%
Children 1.7%

BRAZIL 2003
Canoas (part)
6.8%

Problems with WHO survey protocol

- Official protocol unchanged since 1999 (informal update by CBM in 2010)
- Time consuming & expensive
- OAE testing not available in earlier surveys
- Tympanometry not performed in some surveys
- Cause-specific data of poor quality
- Software out of date

WHO Expert Group

- Review & update protocol & software
- Develop rapid assessment survey method
- Look at smart- phone based testing
- Simple data entry tool (smart-phone, tablet)
- Automated and distance analysis

1st meeting in November, 2015 in London

2nd meeting in April, 2017 in London

WHO Expert Group

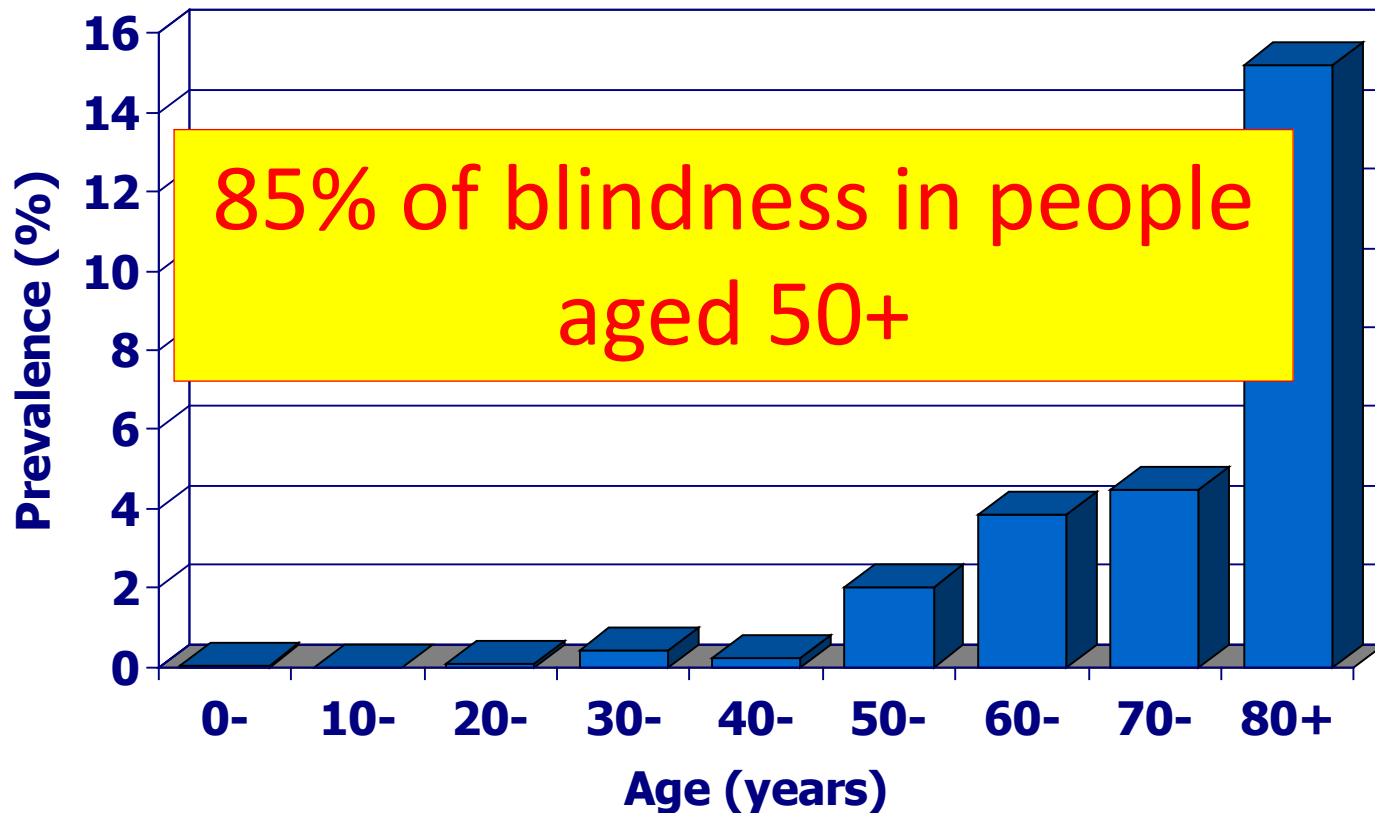
- Review & update protocol & software
- **Develop rapid assessment survey method**
- Look at smart- phone based testing
- Simple data entry tool (smart-phone, tablet)
- Automated and distance analysis

1st meeting in November, 2015 in London

2nd meeting in April, 2017 in London

The Gambia: Blindness by age

(Faal H, Minassian DC, Dolin PJ, et al. Evaluation of a national eye care programme: re-survey after 10 years. *Br J Ophthalmol.* 2000;84:948–951)



Slide courtesy of Tess Bright, LSHTM

The Gambia: Causes of blindness

Cause of blindness	Total population	Population 50+
Cataract	46%	48%
Aphakia	13%	15%
Trachoma/CO	22%	17%
Glaucoma	9%	11%
Other	11%	9%

RAAB vs RAHL

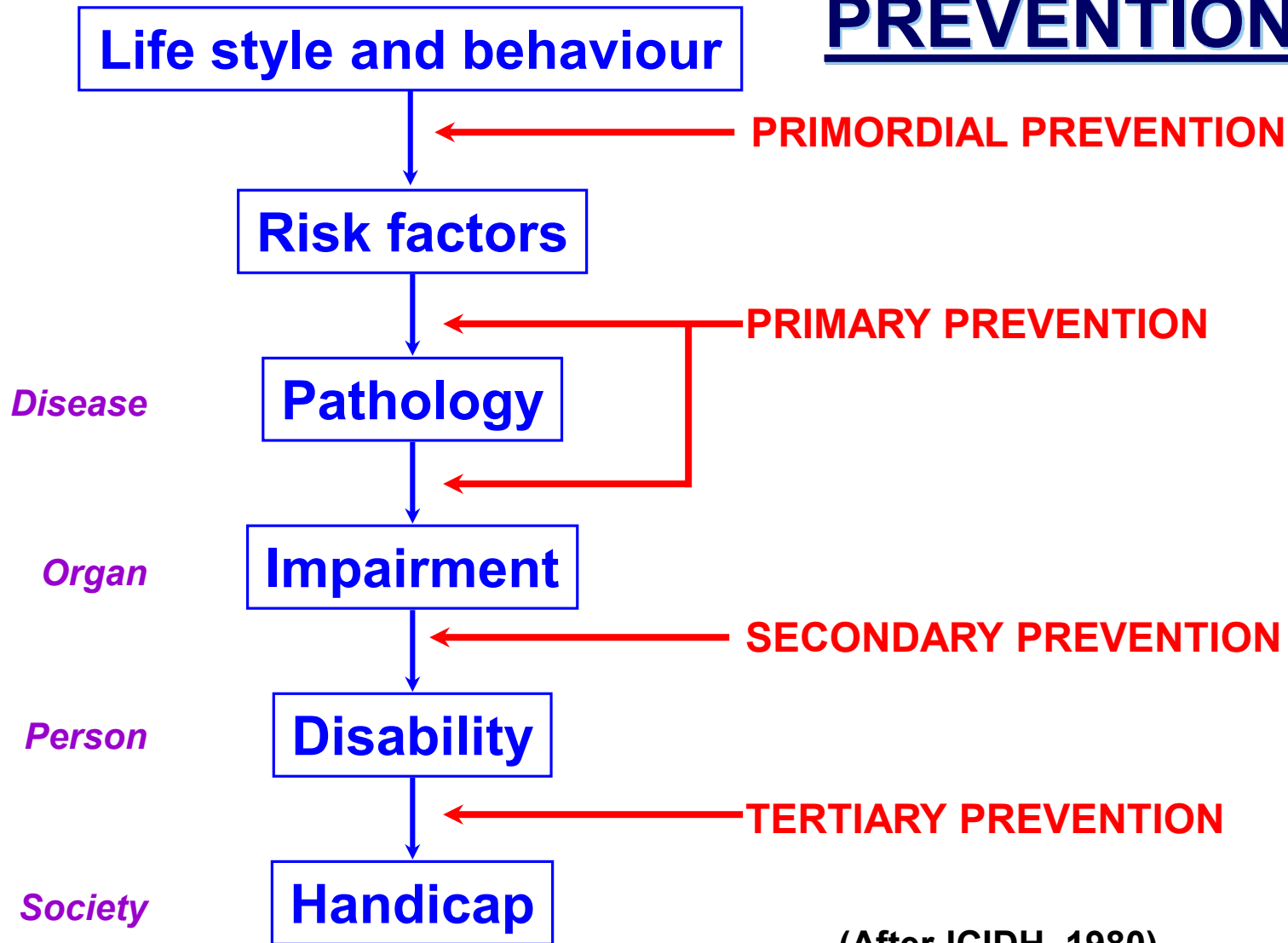
	RAAB	RAHL
Proportion of condition in those aged 50+	>80%	>70%
Sample size required	2500-5000	1000 (FULL SURVEY WAS 6000)
Examination	Basic	More complex than RAAB, simpler than full survey (older people at home)
Duration	Months	Weeks (FULL SURVEY 3-6M)
Outcomes	Planning/follow up	Planning/follow up
Human resources	Local staff	Local staff
Cost	20-40,000 USD	TBD
Analysis	Automatic	Manual (currently)

Slide courtesy of Tess Bright, LSHTM

OUTLINE OF PRESENTATION

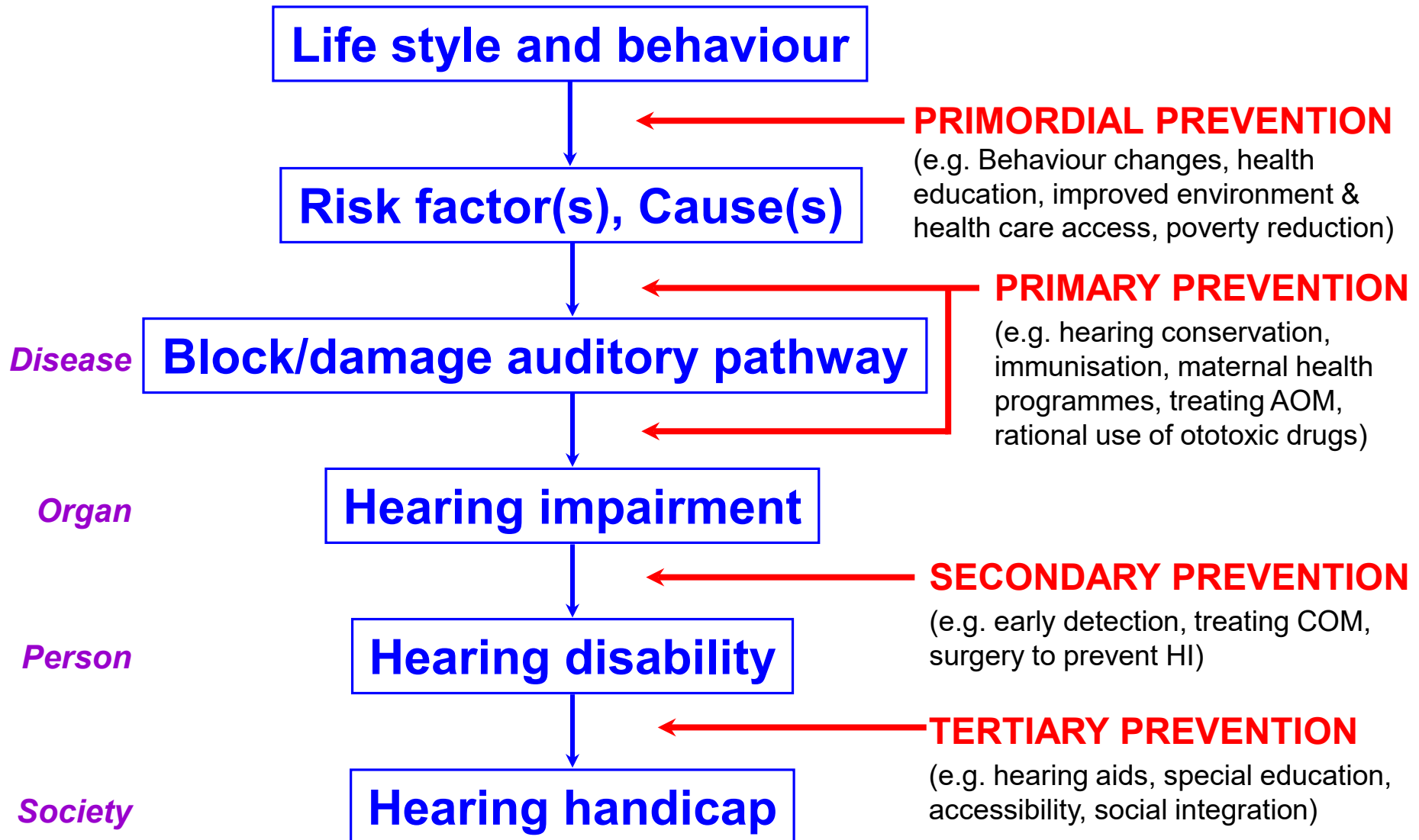
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CHAIN OF CAUSATION LEVELS OF PREVENTION



(After ICIDH, 1980)

CAUSATION MODEL FOR HEARING LOSS



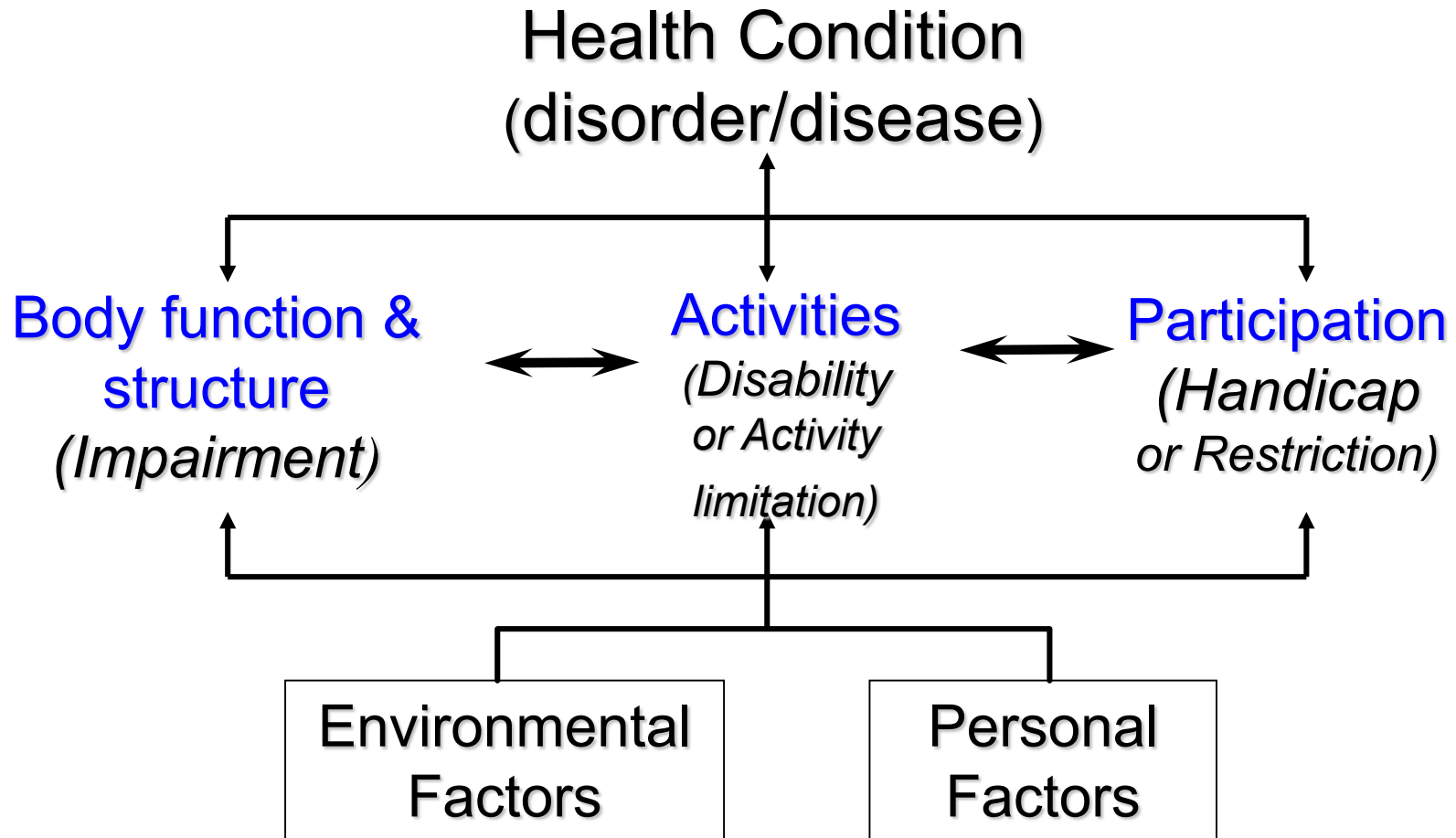
(After ICIDH, 1980)

PRIMARY, SECONDARY & TERTIARY PREVENTION

Causes	Primary	Secondary	Tertiary	Priority
Adult causes				
Excessive Noise	Health education/ promotion, Conservation Legislation, reduction	Change of environment, screening	Hearing aids	
Ototoxicity	Health education/ promotion, avoidance legislation, rational use	Early detection,	(Special education)	
Otosclerosis	Counselling			
Trauma	Health education/ promotion, legislation, helmets, seat belts	& surgery	Rehabilita tion	
Presbycusis	Avoid ototoxics, excessive noise	Adult screening		

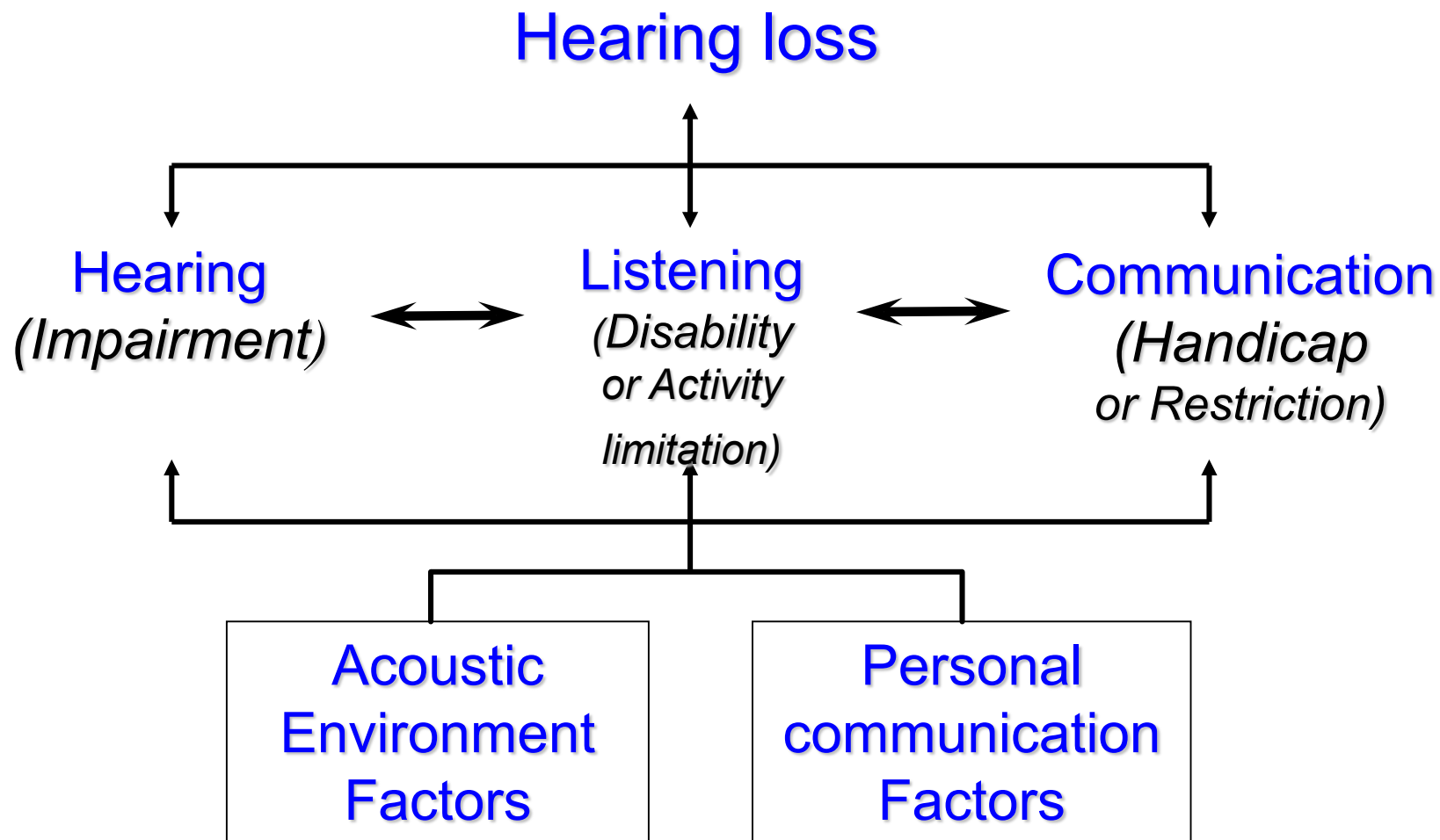
Concepts in ICF 2001

(International Classification of Functioning, Disability & Health)



Concepts in ICF 2001

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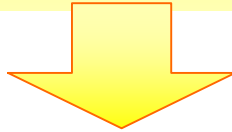
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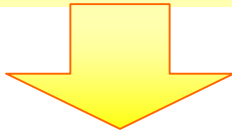
**WHAT IS THE FIRST KEY CRITERION
FOR SELECTING AN INTERVENTION?**

ROUTE TO PREVENTION OF DEAFNESS AND HEARING IMPAIRMENT

Develop a public health orientation



Find ways to make a difference in a population

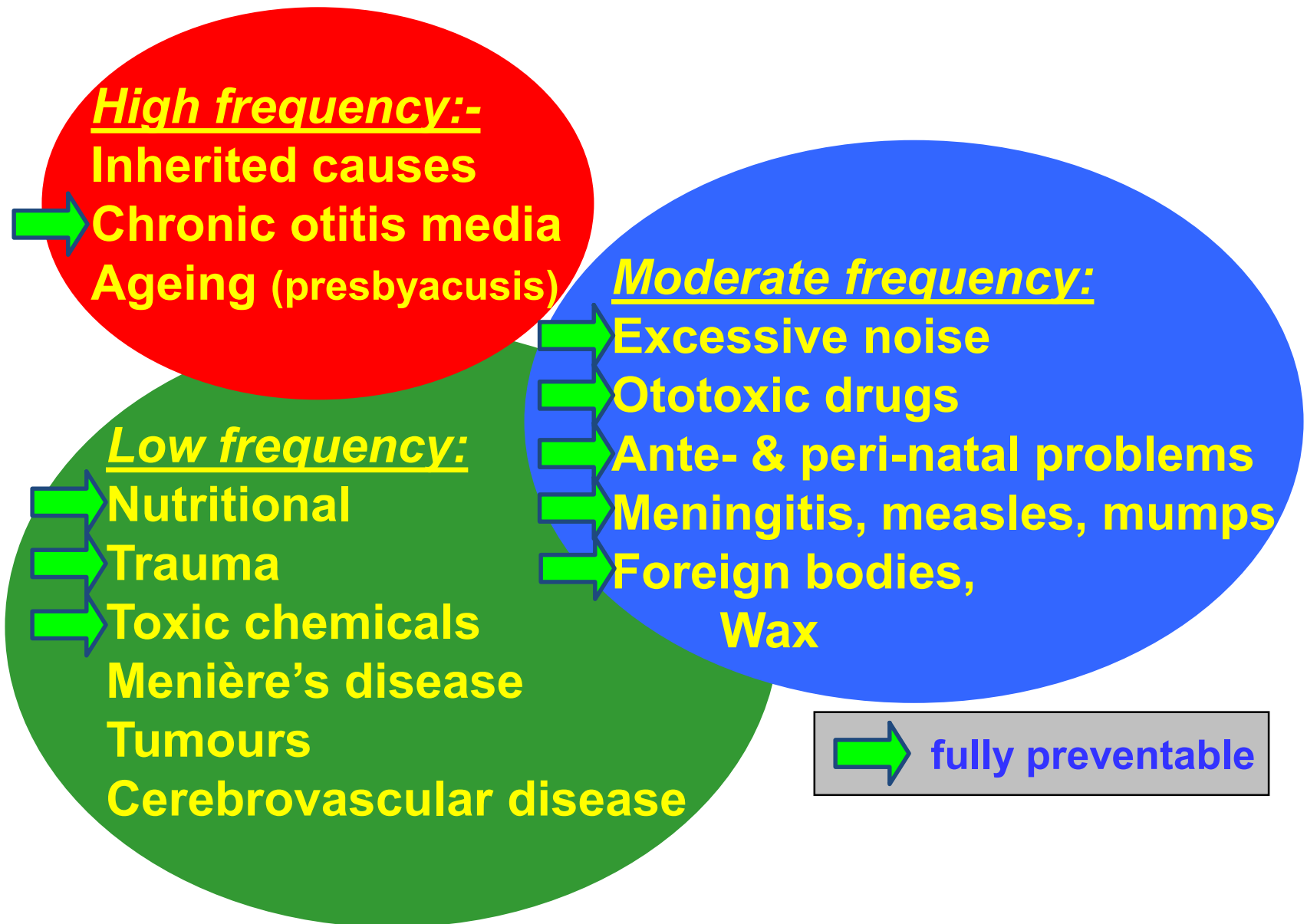


Target conditions with...

(1) High Prevalence
+
(2) Effective Means of
Prevention / Control

1st CRITERION FOR SELECTING
AN INTERVENTION

What conditions should be targeted?



**WHAT IS THE SECOND KEY CRITERION
FOR SELECTING AN INTERVENTION?**

**WHAT IS THE SECOND KEY CRITERION
FOR SELECTING AN INTERVENTION?**

ANSWER:

**Develop public health
interventions that are cost-
effective.**

**What public health programmes
are cost-effective?**

What public health programmes are cost-effective?

- (1) Primary ear and hearing care**
- (2) Providing affordable hearing aids on a massive scale**
- (3) Global & National programmes to reduce burden of hearing loss**
- (4) Training for programme planning**
- (5) Health education, advocacy**

Do we have evidence of cost-effectiveness?

Think about how we could measure it

Another public health intervention.....

Advocacy - needed at different levels

- **Community**
- **Health Care Workers at all levels**
- **Policy makers**
- **National level**
- **Global level**

Action on Hearing Loss (RNID): **LOVE YOUR EARS CAMPAIGN**



Loud Music Campaign

ACTION ON
HEARING
~~LOSS~~

LOUD MUSIC.

Loud music can damage
your hearing, permanently.

Protect it.
loudmusic.org.uk



Registered Charity numbers:
207700 (England and Wales)
and 1000008 (Scotland)





ACTION ON HEARING LOSS

LOUD MUSIC.

LOUD MUSIC CAN DAMAGE your hearing, permanently. Find out more at hearingloss.org.uk

A black and white photograph of a woman's face. A power drill bit is positioned against her right ear, with a hand holding the drill. The woman has a serious expression.

CLEARCHANNEL

DIGITAL



MINI CABS

CAFÉ BENJAMIN



COLLECTOR

1 FISH

Exchange - cambio de moneda - Scambio di D

KEY EXCHANGE



Target audience



© KJ Pargeter * www.ClipartOf.com/28312



Role of WHO

Prevention of deafness and hearing loss

The Seventieth World Health Assembly,

Having considered the report on prevention of deafness and hearing loss;¹

Recognizing that 360 million people across the world live with disabling hearing loss, a total that includes 32 million children and nearly 180 million older adults;

Acknowledging that nearly 90% of the people with hearing loss live in low- and middle-income countries, which often lack resources and strategies to address hearing loss;

Concerned by the persistent high prevalence of chronic ear diseases, such as chronic suppurative otitis media, which lead to hearing loss and may cause life-threatening complications;

Acknowledging the significance of work-related, noise-induced hearing loss, in addition to issues related to recreational and environmental noise-induced hearing loss;

Aware that unaddressed hearing loss is linked with cognitive decline and contributes to the burden of depression and dementia, especially in older adults;

Noting the significant impact of ear diseases and hearing loss on the development, ability to communicate, education, livelihood, social well-being and economic independence of individuals, as well as on communities and countries;

NEW WHA RESOLUTION calls on governments to:-

- collect quality population data on ear disease & hearing loss
- integrate EHC strategies within PHC systems.
- establish suitable training programmes in E&HC.
- ensure highest vaccine coverage against MMR.
- implement early screening in high-risk populations (eg for CSOM, infants, children, elderly, noise-exposed).
- improve access to affordable, cost-effective, quality, assistive hearing technologies and products.
- develop/ implement regulations for control of work & leisure noise & control of ototoxic medicines.
- promote alternative means of communication (eg SL, captions).
- work towards SDG 3 (healthy lives), SDG 4 (education for all).

What can you do?

- Lobby your government
 - to support & implement the new resolution & action plan in your country
 - to develop a national programme and mobilise resources
- Regional Health Assembly
 - support new Resolution on PHI
 - propose action plan
- Lobby other Global bodies in your country
 - UN & other UN bodies (UNICEF, UNESCO)
 - World Health Summit

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What can you do?

“Think globally, act locally”

- **Lobby your Minister or DMS**
 - to support & implement the new resolution & action plan in your country
 - to develop a national programme and mobilise resources
- **Regional Health Assembly**
 - support new Resolution on PHI
 - propose action plan
- **Lobby other Global bodies in your country**
 - UN & other UN bodies (UNICEF, UNESCO)
 - World Health Summit



© WHO/Chris de Bode

Luciano dos Santos Rocha Junior, Sao Paulo Favela (slum), wearing his new hearing aids

Thanks for listening!